Indicators for Large Rivers

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RESEARCH & DEVELOPMENT
Building a scientific foundation for sound environmental decisions

Indicators Workgroup

- Gretchin Hayslip (Region 10, Lead)
- Tom Faber (Region 1)
- Larry Merrill (Region 3)
- Lou Reynolds (Region 3)
- Ed Hammer (Region 5)
- Larry Shepard (Region 7)
- Tina Laidlaw (Region 8)
- Lillian Herger (Region 10)
- Joe Flotemersch (ORD-Cincinnati)
- Brian Hill (ORD-Duluth)
- Evan Hornig (OW, OST)

Objectives of the Non-Wadeable Rivers Survey

1. **Conduct a statistically valid assessment of the ecological condition of National Rivers**

2. **Build capacity**

Objectives of Indicators Session

- **Review "Core" and "Potential" indicators**
- **Facilitate open discussion on pros and cons of each**
- **Identify a candidate list of "best fits" indicators**
- **Discuss and document methodological variables that will require additional discussion**

Core and Potential Indicators

- Core: All National Surveys
  - Physical Habitat
  - Water Chemistry
  - Benthic Macroinvertebrates
- Core: Rivers (Proposed)
  - Physicochemical
  - Benthic Macs
  - Fish
  - A human health/recreation indicator(s)
- Potential additional indicators

  Metals, fish tissue, algae (peri/phyto), remote sensing, others

Reminder…

Targeting at least two bioindicators

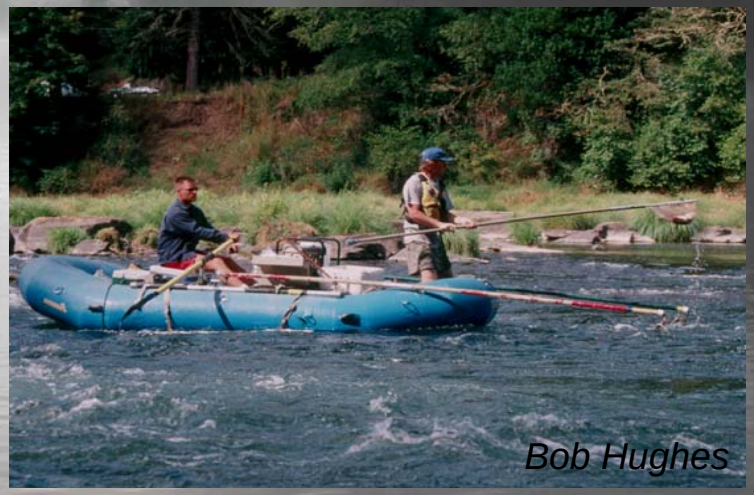
Desirable Indicator Traits

- Sampleable in a single day visit
- Sampleable at all sites
- Present in sufficient numbers to yield a useful sample (condition dependent)
- Contributes to the condition assessment
- Has diagnostic capabilities
- Useful across a wide range of conditions

Desirable Indicator Traits

- Sample effort required $\propto$ Data value
- Subjectivity of the method minimized across crews and sites
- Signal : Noise
  - Data variability most associated with changes in condition rather than:
    - Sample time
    - Crew
    - Exact sample point

Methods…



Methods Associated with Indicators

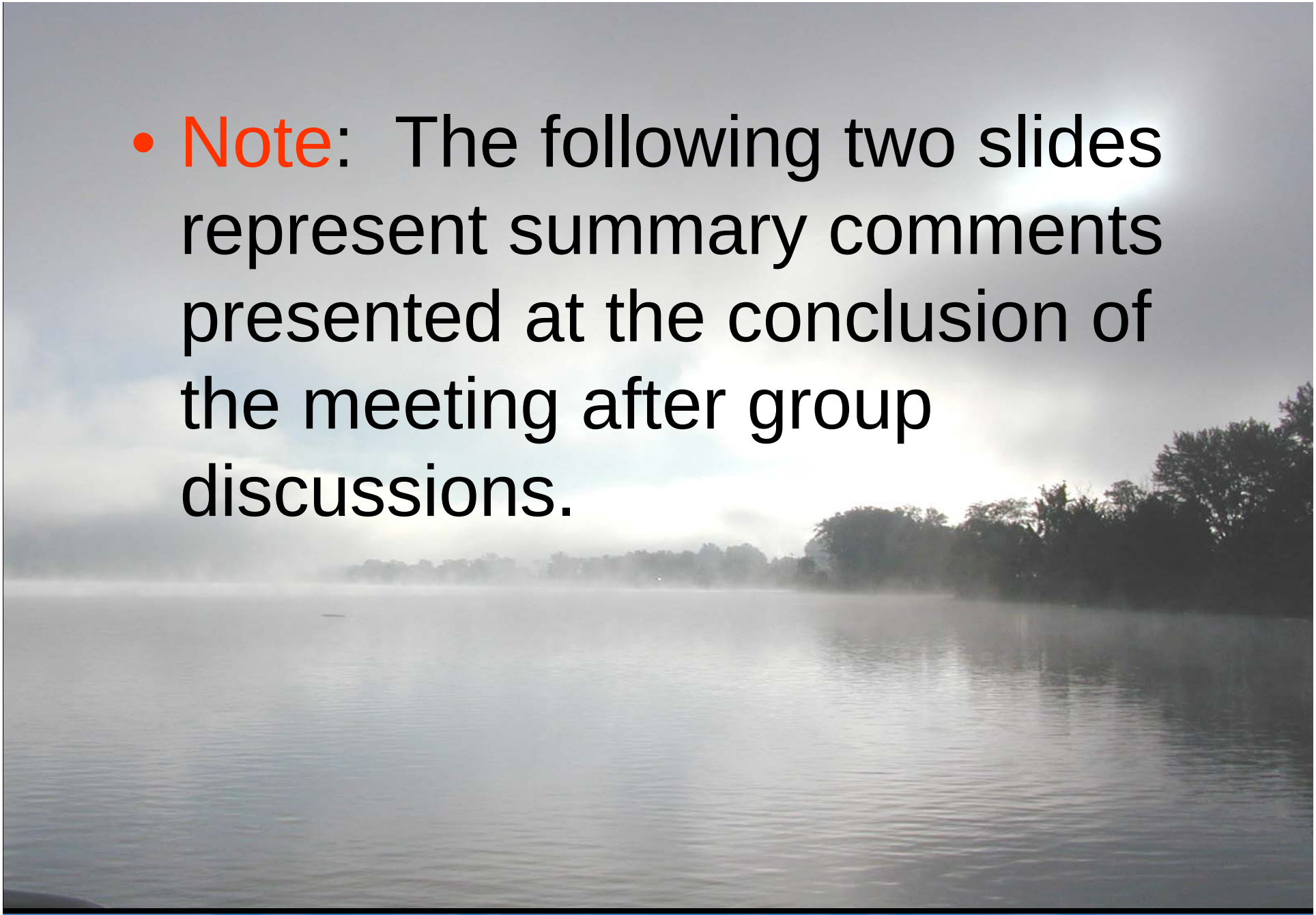
- **Use methods where we have documented the comparability with other methods**

- **Ideally, we know the performance characteristics of the methods utilized.**
  - **Precision**
  - **Bias**
  - **Representativeness**
  - **Responsiveness**

Finding a Balance

The indicators we select will influence the number of sites that can be sampled

- **Field cost**
- **Laboratory cost**



- Note: The following two slides represent summary comments presented at the conclusion of the meeting after group discussions.

-Summary-

- Indicators of interest to workgroup
  - Water Chemistry
  - Physical Habitat
  - Bioindicators – give different messages
    - Fish
      - Also interested in some sort of fish tissue sample
    - Benthic Macroinvertebrates
      - Explore flexibility in the method
    - Algae
  - Recreational Indicator

-Next Steps

- Form workgroup
  - If interested in participating in the workgroup, contact Treda Smith

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    202-566-0916

- Formulate cost estimates
- Develop criteria for including or excluding
- Draft indicators w/protocols